भारतीय मानक
Indian Standard

IS 11637 : 2022

कैल्शियम आधारित ई पी ग्रीस — विशिष्टि

(पहला पुनरीक्षण)

Calcium Based EP Grease — Specification

(First Revision)

ICS 75.100

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली – 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.gov.in www.standardsbis.in

March 2022 **Price Group 7**

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Lubricants and their Related Products Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Calcium EP grease is extensively used by the steel industry and other industries for lubrication. This standard is intended chiefly to cover the technical provisions relating to the supply of the calcium EP grease, and it does not include all the necessary provisions of a contract.

This standard was initially published in 1986, taking considerable assistance from the Interplant Steel Standard IPSS 1-09-009-78.

In this first revision, the requirements of viscosity index (90 *Min*) and flash point (180 °C, *Min*) are modified and EP and anti-wear additives are included in **4.2**. Clauses for references and marking have been updated.

The composition of the committee responsible for the formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

CALCIUM BASED EP GREASE — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for calcium EP grease suitable for heavily loaded bearings operating at temperature up to 65 °C.

WARNING — This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2 REFERENCES

The following Indian Standards contain provisions which through reference in this text constitute the provisions of the standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
1447 (Part 3) : 2021	Methods of sampling of petroleum and its products: Part 3 Method of sampling of semi-solid and solid petroleum products (*second revision*)
1448	Methods of tests for petroleum and its products
(Part 4/Sec 1) : 2021	Part 4/Section 1 Determination of ash (*fourth revision*)
(Part 25/Sec 1) : 2018/ISO 3104 : 1994	Transparent and opaque liquids, Section 1 Determination of kinematic viscosity and calculation of dynamic viscosity (*second revision*)
(Part 40) : 2015/ ISO 3733 : 1999	Petroleum products and bituminous materials — Determination of water — Distillation method (*fourth revision*)
(Part 51) : 1963	Copper strip corrosion test for lubricating greases
(Part 52) : 2017/ ISO 2176 : 1995	Drop point (*second revision*)
(Part 53) : 1979	Determination of acidity and alkalinity of greases (*first revision*)
(Part 56) : 2013/ ISO 2909 : 2002	Calculation of viscosity index from kinematic viscosity (*third revision*)
(Part 60) : 1994	Consistency of lubricating greases by cone penetrometer (*second revision*)
(Part 62) : 1974	Heat stability of greases (*first revision*)
(Part 69) : 2019/ ISO 2592 : 2017	Determination flash and fire points — Cleveland open cup method (*second revision*)
(Part 90) : 2008/ ISO 11009 : 2000	Petroleum products and lubricants — Determination of water washout characteristics of lubricating greases (*first revision*)
(Part 94) : 2019	Test for oxidation stability of lubricating greases by oxygen pressure vessel method (*first revision*)
(Part 165) : 2018	Method for roll stability of lubricating grease
7794 : 1984	Specification for manual portable grease guns (*first revision*)

3 GRADES

The material shall be of the following two grades:

a) Grade 1; and

b) Grade 2.

4 REQUIREMENTS

4.1 General

The material shall be smooth and homogeneous and free from objectionable odor and visible impurities and shall possess good pump ability characteristics (*see* Annex A). It shall be free from deleterious materials and fillers of any description and shall not show any signs of breakdown, hardening or tendency of the constituents to separate.

4.2 Composition

The material shall consist of the following ingredients:

a) Refined mineral oil;

b) A suitable calcium soap;

c) Anti-oxidants; and

d) EP and anti-wear additives.

4.3 Keeping Quality

The material when stored in original sealed containers under normal temperature conditions and under cover shall retain the properties described under **4** for a period of not less than one year after the date of manufacture.

4.4 The material shall also comply with the requirements given in Table 1, when tested according to the methods given in co1 5 of the table.

5 PACKING AND MARKING

5.1 Packing

The material shall be packed in metal or any other suitable containers as agreed to between the purchaser and the supplier.

5.2 Marking

5.2.1 Material shall be marked with the following information:

a) Name and grade of the material;

b) Manufacturer's name, initials or trade-mark, if any;

c) Net mass of material;

d) Identification in code or otherwise to enable the lot of consignment or manufacture to be traced back from records and

e) Any other statutory requirements.

5.2.2 *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

6 SAMPLING

Representative samples of the material shall be drawn as prescribed in IS 1447 (Part 1).

6.1 Number of Tests

Individual containers selected according to IS 1447 (Part 3) shall be opened and examined for the general requirements given in **4.1**. Tests for consistency, free organic acidity and free alkalinity shall be done on individual samples. Tests for copper strip corrosion shall be conducted on two of the individual samples.

6.1.1 Tests for all the remaining characteristics shall be done on the composite sample prepared by mixing small portions from individual containers selected in the sample.

6.2 Criteria for Conformity

The lot shall be declared acceptable only if each of the test results obtained under **6.1** and **6.1.1** satisfies the relevant requirements.

Table 1 Requirements for Calcium EP Grease

(*Clause* 4.4)

Sl No.	Characteristic	Requirement		Method of Tests, Ref to Part of IS 1448/ASTM/IP/Annex
		Grade 1	Grade 2	
(1)	(2)	(3)	(4)	(5)
i)	Kinematic viscosity of mineral oil extracted from the grease at 100 °C, mm^2/s[1)]	13 to 16	13 to 16	(Part 25/ Sec 1)
ii)	Viscosity index, *Min*	90	90	(Part 56)
iii)	Flash point, Cleveland open cup, °C, *Min*	180	180	(Part 69)
iv)	Penetration or consistency at 25 °C ± 0.5 °C			(Part 60)
	a) At 60 double strokes	310 to 340	265 to 295	
	b) At 10 000 double strokes	Shall not be more than 20 units from the penetration at 60 double strokes		
v)	Drop point, °C, *Min*	100	100	(Part 52)
vi)	Free organic acidity (as oleic acid), percent by mass	To be reported		(Part 53)
vii)	Free alkalinity [as Ca $(OH)_2$], percent by mass	To be reported		(Part 53)
viii)	Sulphated ash, percent by mass, *Max*	5.0	5.0	(Part 4)
ix)	Low temperature pumping properties	Shall be easily pumpable		A
x)	Timken OK load, kg, *Min*[2)]	18	18	D2509
xi)	Copper strip corrosion at 75ºC for 24 h	Negative	Negative	(Part 51)
xii)	Resistance to water washout, percent loss by mass, at 40 °C, *Max*	5	5	(Part 90)
xiii)	Oxidation stability (100 h), drop in pressure, kgf/cm^2, at 65 °C, *Max*[2)]	1.0	1.0	(Part 94)
xiv	Roll stability change in consistency in 16 h, percent, *Max*[2)]	25	25	(Part 165)
xv)	Leakage and deposit forming tendencies (wheel bearing test)[2)]			B
	a) Leakage by mass at 65 °C for 3 h, *Max*	10 g	10 g	
	b) Deposit in the wheel bearing races or the rollers	Shall be free from deposits		
	c) Evidence of abnormal changes in the consistency of structure of the material	Not limited , but observation are to be reported		
	d) Indication of dry running of races	do		
xvi)	Freedom from deleterious particles, permitted number of scratches, *Max*	10	10	(Part 125)
xvii)	Heat stability at 95 ± 1 °C[3)]	No sign of breakdown of marked change in consistency or separation of oil		(Part 62) (Method A)
xviii)	Water content, percent by mass, *Max*	1.0	1.0	(Part 40)
xix)	Emcor rust test, rating *Max*[2)]	0.0	0.0	IP 220

[1)] 1 cSt = 1 mm^2/s.

[2)] These are type test for which manufacturers/suppliers shall give the guarantee for their compliance

[3)] For defence requirements this test may be carried out at 120 ± 1 °C.

ANNEX A

[*Clause* 4.1 *and Table* 1, *Sl No.* (ix)]

DETERMINATION OF LOW TEMPERATURE PUMPIG PROPERTIES

A-1 APPARATUS

A-1.1 Grease Gun — Push type (*see* IS 7794).

A-1.2 Refrigerator — Capable of being maintained at – 18 ± 1 °C.

A-2 PROCEDURE

A-2.1 Fill the gun with grease and place in a refrigerator at – 18 °C.

A-2.2 Maintain at the test temperature for 24 h.

A-2.3 Remove the gun from the refrigerator and operate it immediately (*see* Note).

NOTE — Protective gloves should be worn during the test.

ANNEX B

[*Table* 1, *Sl No.* (xv)]

DETERMINATION OF THE LEAKAGE TENDENCIES OF AUTOMOTIVE WHEEL BEARING GREASES

B-1 GENERAL

This test method describes the assessment of the leakage tendencies of wheel bearing greases when tested under prescribed laboratory conditions.

B-2 TERMINOLOGY

B-2.1 Lubricating Grease

A semi-fluid to solid product of a dispersion of a thickener in a liquid lubricant.

B-2.1.1 A two-phase system is formed by the dispersion of thickener, immobilizing the liquid lubricant, due to surface tension and other physical forces. Other ingredients are added to get other special properties.

B-2.2 Lubricant

Any material, which when interposed in between two surfaces, lowers down the friction or wear between them.

B-2.3 Thickener

In lubricating grease, a substance used to form the structure of product, composed of finely-divided particles dispersed in a liquid lubricant.

B-2.3.1 The solid thickener can be spheres (such as certain non-soap thickeners) or fibers (such as various metallic soaps) or plates. The solid particles are insoluble or, at the most, only very slightly soluble in the liquid lubricant. Solid particles should generally be uniformly dispersed, extremely small, and capable of forming a gel-like, relatively stable structure with the liquid lubricant.

B-2.4 Automotive Wheel Bearing Grease

A lubricating grease categorically created formed to lubricate automotive wheel bearings at relatively high temperature of grease and bearing speed.

B-2.5 Leakage of Wheel Bearing Grease

Segregation and overflow of oil or grease from the bulk grease charge, activated by high temperature and bearing rotation.

B-3 PRINCIPLE

B-3.1 The grease is distributed in a modified front-wheel hub and spindle assembly. Spindle temperature is raised to and maintained at 105 ± 1.2 °C. The hub is rotated at a speed of 660 ± 30 rpm for 6 h ± 5 min. Leakage of oil or grease, or both, is measured, and at the end of the test, the condition of the bearing surface is noted.

B-3.2 A screening device is provided by the test method that allows differentiation among products of distinctly different leakage characteristics. This test method is not equivalent to longtime service tests and it is also not aimed at distinguishing between wheel bearing greases showing similar or borderline leakage.

NOTE — Skilled operators may observe significant changes in other important grease characteristics that occur during the test. Such additional information can be of special interest to individual operators. The observations, however, cannot be used effectively for quantitative rating, as these are subject to differences in personal judgment among operators.

B-4 APPARATUS

B-4.1 The suitable apparatus is shown in Fig. 1 and Fig. 2. The tester has a special front wheel hub and spindle assembly and the hub is rotated by an electric motor using a V-belt drive. The assembly is encased in a thermostatically controlled air bath. There are means to measure both ambient (cabinet) and spindle temperatures. A torque wrench is also required, which is suitable for use on 31.75 mm hexagonal nuts.

B-4.2 The apparatus (spindle, case, and motor) must be electrically grounded, otherwise the thermocouples will not function due to accumulated static charges. Provision is made for this, as shown in Fig. 2.

B-4.3 Usually machine having 660 W heaters will provide sufficient heat input to attain the temperatures in the specified time intervals. However, if proper balance cannot be obtained, heaters with required wattage can be substituted.

B-4.4 Main Assembly

The main assembly shall consist of spindle assembly mounted in a thermostatically controlled air bath and a special front-wheel hub. The assembly is arranged so that the hub will be rotated by an electric motor through a V-belt drive, as shown in Fig. 2. One continuous and one intermittent heater shall be mounted on the base of the apparatus and shall be controlled thermostatically.

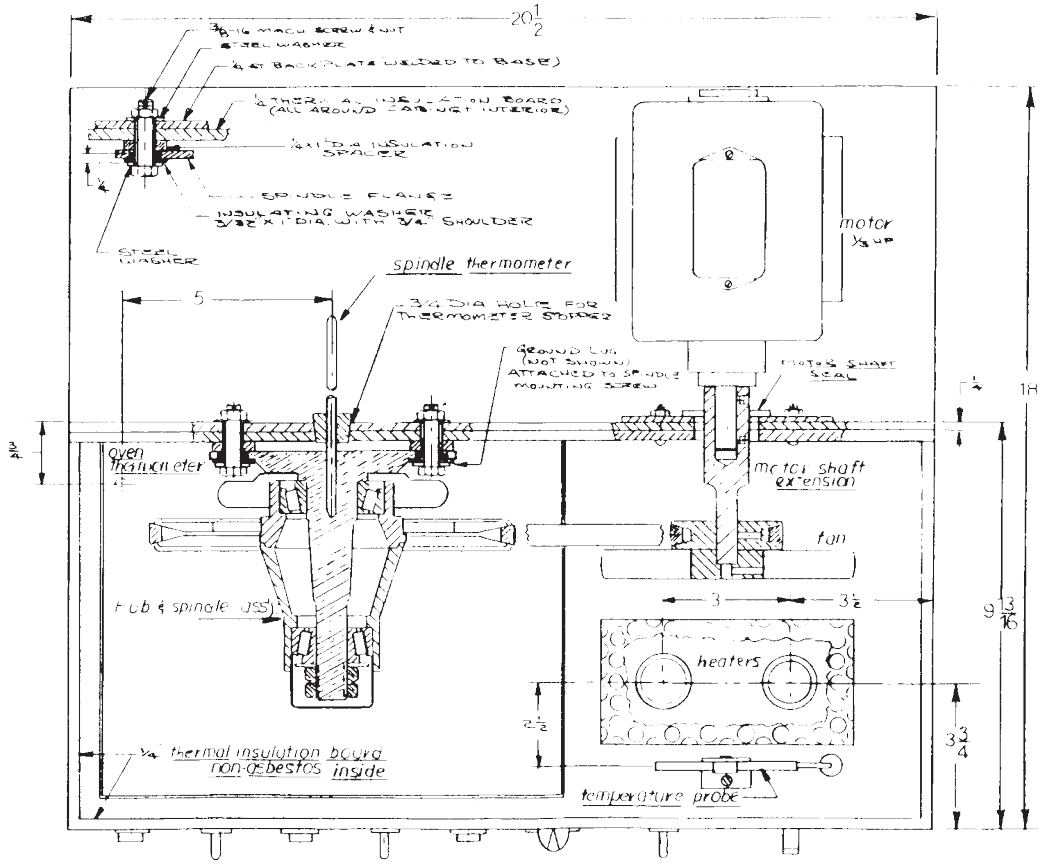
B-4.5 Bearing Spindle

The spindle shall be constructed as shown in Fig. 3.

B-4.6 Bearing Hub

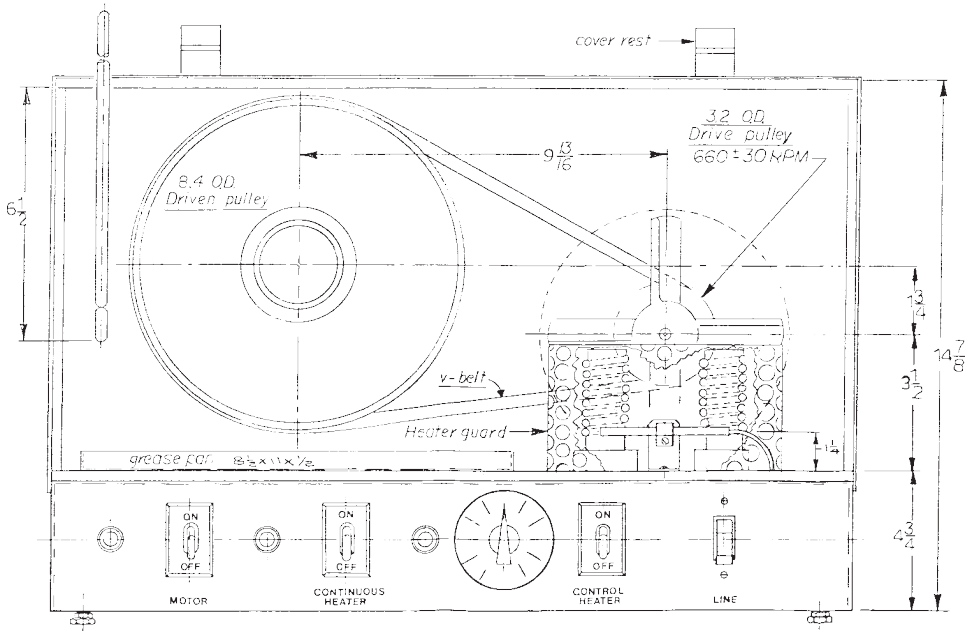
The bearing hub shall be constructed as shown in Fig. 4.

FIG. 1 APPARATUS FOR TESTING LEAKAGE TENDENCIES OF WHEEL BEARING GREASES



All dimensions in inch

FIG. 2A DETAILS OF MAIN ASSEMBLY



All dimensions in inch

FIG. 2B DETAILS OF MAIN ASSEMBLY

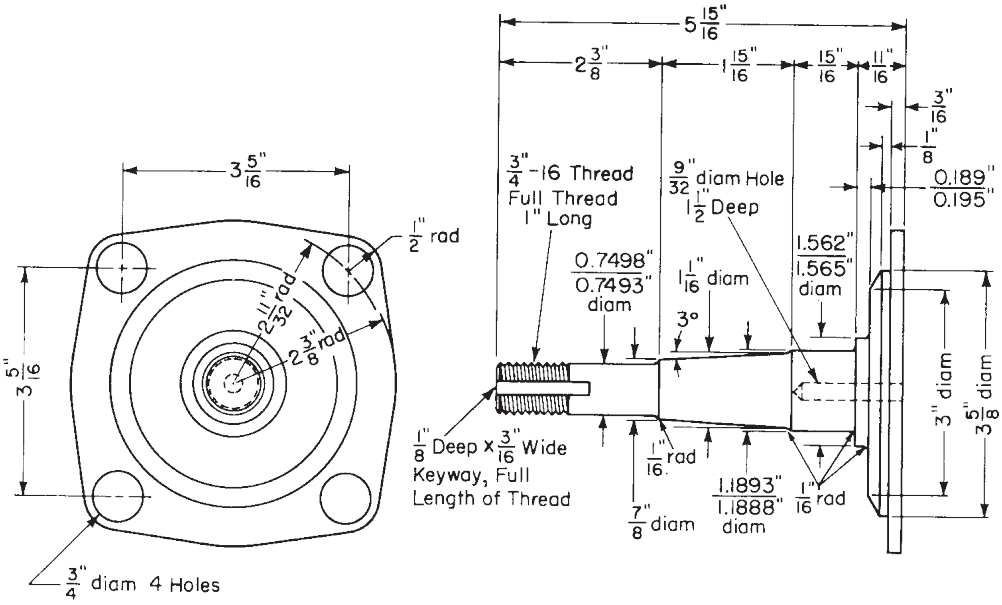


FIG. 3 DETAILS OF MAIN SPINDLE

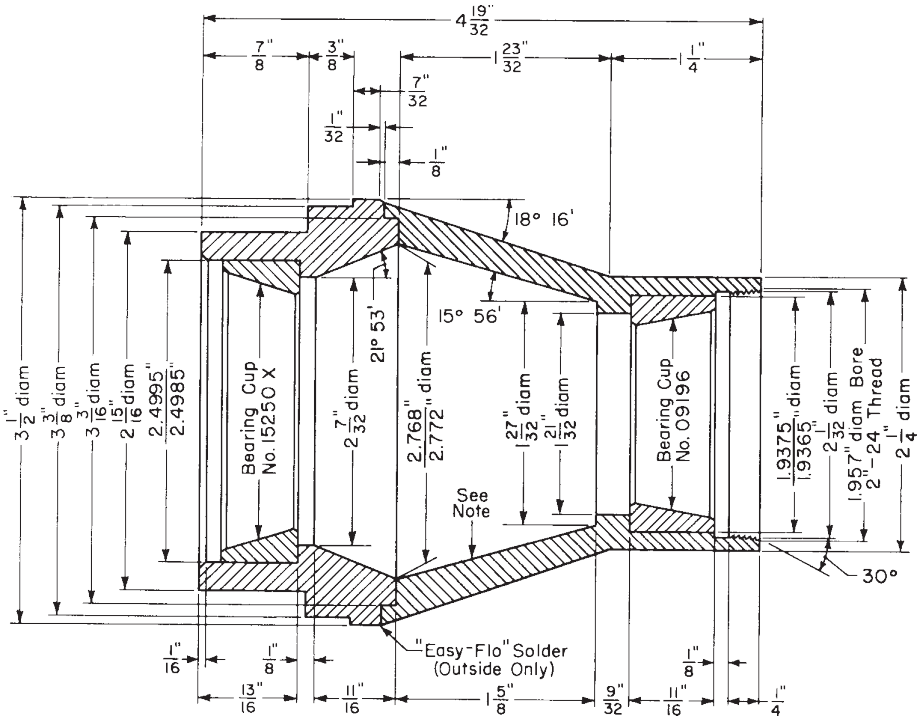


FIG. 4 DETAILS OF BEARING HUB

B-4.7 Leakage Collector

A cup-shaped ring shall be used as a leakage collector to catch any leaked grease from the inner end of the hub, as shown in Fig. 5. The ring shall be removable providing a method for determining the grease loss. The ring is held in place by the large bearing.

NOTE — The regular grease retainer is not suitable for this purpose, as it is required to accelerate any leakage that may occur. Also retainers are frequently found to be defective.

B-4.8 Fan

The fan shall be constructed as shown in Fig. 6.

NOTE — Polish inside tapered surfaces with waterproof paper. Do not round off sharp corners when polishing. Make both parts of hub assembly from 8.89 cm round cold drawn steel rod.

B-4.9 Test Bearings

B-4.9.1 *Inner Bearing* (*Tapered Roller*) — Timken 15118. The corresponding cup No. 15250.

B-4.9.2 *Smaller Outer Bearing* — Timken 09074. The corresponding cup No. 09196.

B-5 REAGENT

B-5.1 Heptane — 99.87 percent purity.

WARNING — Flammable. Harmful if inhaled.

B-6 PROCEDURE

B-6.1 Weigh 90 ± 1 g of sample on a flat plate. Pack 2 ± 0.1 g of grease in the small bearing using a spatula. Similarly, pack 3 ± 0.1 g of grease in the large bearing.

B-6.2 On the inside of the hub, distribute the balance of the test grease (85 g) in a uniform layer. Apply a thin film of grease to the bearing races in the hub.

NOTES

1 A narrow, wedge-cut spatula is suitable for packing the bearings.

2 Rest of the grease will fill the hub sufficiently, even with the races and except for very fibrous greases, it can be distributed quickly and uniformly with a spatula of 150 mm blade.

B-6.3 Weigh the leakage collector and the hub cap to the nearest 0.1 g separately. Put the large (inner) bearing and leakage collector in the proper position on the spindle. Put small (outer) bearing and the hub and on the spindle, followed by the loose-fitting retainer ring. Tighten the hexagonal nut which holds the hub assembly in place, applying a torque of 6.8 ± 0.1 N·m using the torque wrench. Then back off the hexagonal nut 60 ± 5° (or one flat), and lock it in position with a second hexagonal nut. Put screws on the hub cap and V-belt on the pulleys, and close the cabinet.

Caution — Inspect all the grease collectors carefully to make sure that the inner lip is flush with the sealing face. Otherwise, this lip will interfere with the correct seating of the inner bearing.

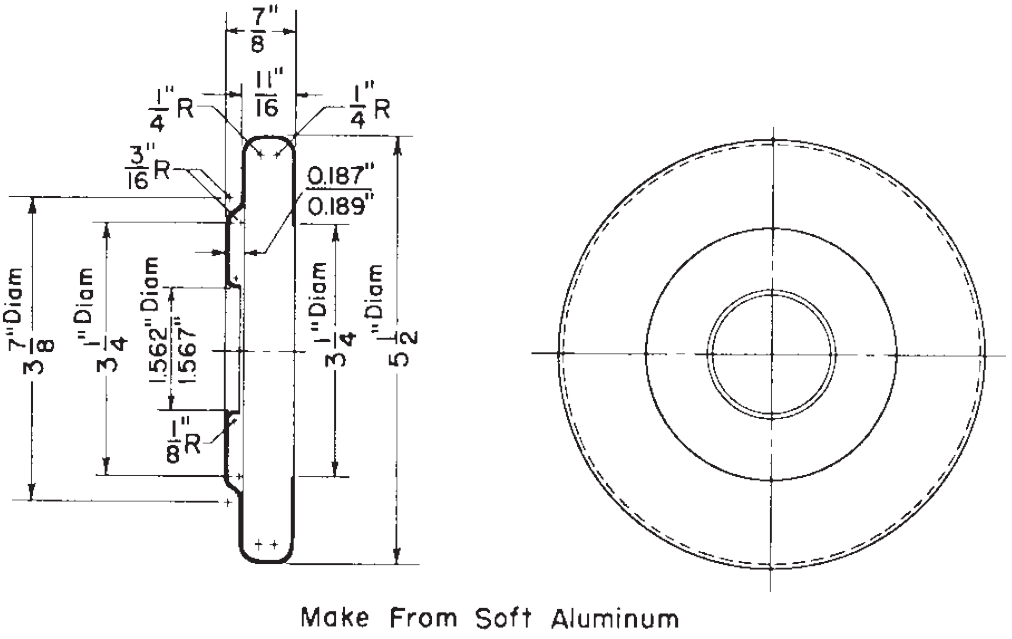


FIG. 5 DETAILS OF GREASE COLLECTOR

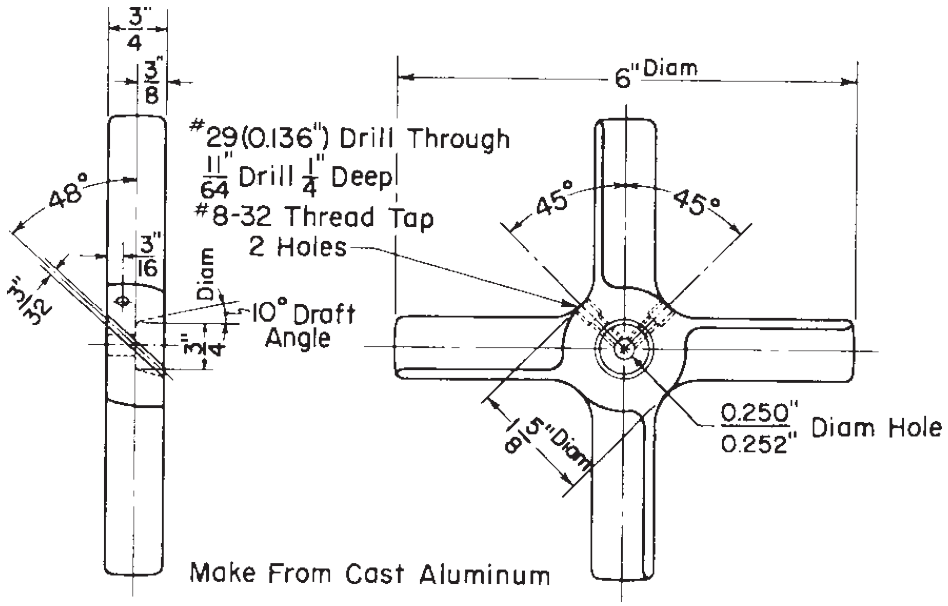


FIG. 6 DETAILS OF FAN

Caution — Prevent contact between grease pack and spindle, while assembling the packed hub on the spindle.

Caution — From time to time, the drive pulley and the driven pulley should be checked for alignment. Misalignment can introduce leakage variations.

NOTE — Excessive end play of the hub assembly is sometimes due to worn bearings. Therefore new bearings, both cups and cones, should be installed after each 250 tests, or sooner if inspection indicates wear or other damage to the bearings.

B-6.4 Close the cabinet and turn on both the heaters and motor. Operate at a speed of 660 ± 30 rpm for 6 h ± 5 min. The spindle temperature to be raised to and then maintained at 105 ± 1.4 °C during the test period. Maintain the ambient temperature at 115 ± 3 °C to obtain the spindle temperature of 105 ± 1.4 °C. Keep the auxiliary heater on till an ambient or oven temperature of 115 °C is attained. Keep the thermoregulator previously adjusted to maintain oven temperature of 115 °C, or to have a reproducible setting for this temperature. The ambient temperature of 115 ± 3 °C shall be attained within 15 ± 5 min. The spindle temperature of 105 ± 1.4 °C shall be attained within 60 ± 10 min. These two combining result in the spindle maintaining at 105 ± 1.4 °C for 5 h ± 15 min.

Caution — Rate of heating can be affected by drafts. Therefore, location of the tester should be carefully chosen.

B-6.5 Shut off the power after 6 h from the time motor and heater are turned on and dismantle the apparatus while hot. Wear appropriate protective clothing while handling the hot equipment.

B-6.6 Let the apparatus cool and measure the weight of the hub cap and leakage collector separately to the nearest 0.1 g.

NOTE — In case of overflow from leakage collector, the amount of overflow grease or oil, or both, should be weighed and included in the reported total leakage.

B-6.7 Wash the two bearings in heptane, at room temperature for at least 2 min, to remove the grease. Inspect for varnish, gum, or lacquer-like deposits.

NOTE — In case of some wheel bearing greases, it will be found that the soaps are not completely washed from the bearings with *n*-heptane and film of soap may remain on the bearings. However, such film can be easily distinguished from varnish, gum, or lacquer-like deposits resulting from deterioration of the lubricant.

B-7 REPORT

Report the total amount of leakage of grease or oil, or both, into the collector and into the hub cap. Report the presence of any adherent deposit of varnish, gum, or lacquer-like material on the bearing surface, which is evident after removal of the grease.

B-8 PRECISION AND BIAS

B-8.1 Repeatability

The difference between two test results, obtained by the same operator with the same apparatus under constant operating conditions on identical test material, would in the long run, in the normal and correct operation of the test method, exceed the following values only in one case in twenty:

Leakage in Area of	Acceptable Difference
2 g	1.5 g
15 to 20 g	9 g

B-8.2 Reproducibility

The difference between two single and independent results obtained by different operators working in different laboratories on identical test material would, in the long run, in the normal and correct operation of the test method, exceed the following values only in one case in twenty:

Leakage in Area of	Acceptable Difference
2 g	4 g
15 to 20 g	9 g

B-8.3 Bias

The procedure in this test method for measuring leakage tendencies of automotive wheel bearing greases has no bias because the value of leakage can be defined only in terms of a test method.

ANNEX C

(*Foreword*)

COMMITTEE COMPOSITION

Lubricants and their Related Products Sectional Committee, PCD 25

Organization	*Representative(s)*
Gulf Oil Lubricants India Limited, Mumbai	Dr Y. P. Rao (***Chairman***)
Afton Chemicals Private Limited, Mumbai	Shri Anand Kumar
Ashok Leyland Limited, Chennai	Shri Mahesh P. Shri D. Balakrishnan (*Alternate*)
Automotive Research Association of India, Pune	Dr S. S. Thipse
BASF India Limited, Mumbai	Ms Anju Sharma Shri Ashok Sambandam (*Alternate*)
Bajaj Auto Limited, Pune	Shri K. Rajan Shri Deepesh Mutke (*Alternate*)
Balmer Lawrie and Company Limited, Kolkata	Dr Mohan Lal Das Shri Srinivasan Murali (*Alternate*)
Bharat Heavy Electrical Limited, New Delhi	Representative
Bharat Petroleum Corporation Limited, Mumbai	Shri R. Subramanian Dr Tarunender Singh (*Alternate*)
Bosch Limited, Bengaluru	Shri Fredrick A. Shri Raghuveer Rao (*Alternate*)
Castrol India Limited, Mumbai	Shri Ashish Gondal Shri Raman Rai (*Alternate*)
Central Pollution Control Board, New Delhi	Shri Dinabandhu Gouda
Centre for High Technology, New Delhi	Shri P. Raman Dr N. S. Raman (*Alternate* I) Shri Shekar Kulkarni (*Alternate* II)
Chennai Petroleum Corporation Limited, Chennai	Dr V. Selvavathi Shri H. Ramakrishnan (*Alternate*)
Consumer Guidance Society of India, Mumbai	Dr Sitaram Dixit Dr M. S. Kamath (*Alternate*)
Defence Research Development Organization, Ministry of Defence, New Delhi	Shri C. B. Pandey
Defence Research and Development Organization, Research Centre Imarat, Hyderabad	Shri Kamal Prakash Singh Shri Sonam Gupta (*Alternate*)
Directorate General of Mines Safety, Dhanbad	Representative
Food Safety and Standards Authority of India, New Delhi	Representative
Gulf Oil Lubricants India Limited, Mumbai	Shri Girish Jange Shri Jencen Mathai Arivannoor (*Alternate*)
Hero Motocorp Limited, New Delhi	Shri Ajay Gupta
Hindustan Petroleum Corporation Limited, Mumbai	Shri Lokender Singh Tevathiya Shri Ashish Khanna (*Alternate*)
IPSS Sail, New Delhi	Shri Avadesh Kumar Gupta Shri G. Sneha Raju (*Alternate*)

Organization	*Representative(s)*
Indian Additives Limited, Chennai	Shri Aanish Dwarkadas Shri Srikanthan (*Alternate*)
Indian Institute of Petroleum, Dehradun	Dr Anil Kumar Sinha Dr G. D. Thakre (*Alternate* I) Shri Sailesh Kr Singh (*Alternate* II)
Indian Oil Corporation (MKTG), Mumbai	Shri Rajesh Nambiar Shri S. Venkatesan (*Alternate*)
Indian Oil Corporation (R and D Centre), Faridabad	Dr Deepak Saxena Dr Pankaj Bhatnagar (*Alternate*)
Indian Oil Corporation Limited-Refineries and Pipelines Division, New Delhi	Shri Ashwani Sharma Shri R. K. Chugh (*Alternate*)
Indian Oil Corporation Limited, Mumbai	Shri Sanjeev Kundu
Indian Sugar Mills Association, New Delhi	Shri G. K. Thakur
Lubrizol India Limited, Mumbai	Shri Sharad Tarsode
Mahindra and Mahindra Limited, Mumbai	Shri R. Ramaprabhu (*Alternate*)
Maruti Udyog Limited, Gurugram	Shri Ashok Permude Shri Narinder Kumar (*Alternate*)
Ministry of Road Transport and Highways, New Delhi	Shri G. Sharan Shri S. S. Nahar (*Alternate*)
National Test House, Kolkata	Dr S. N. Bandhopadhyay Dr Umesh Singh (*Alternate*)
Netra NTPC Limited, Noida	Shri Rajiv Satyakam Ms Vani G. D. (*Alternate*)
Oil Industry Safety Directorate, Noida	Representative
Petroleum Conservation Research Association, New Delhi	Representative
Reliance India Limited, Mumbai	Shri Rahul Saxena
Research Designs and Standards Organization (RDSO), Lucknow	Shri Kamal Prakash Singh Shri Rajesh Srivastava (*Alternate*)
S S Industrial Corporation, Delhi	Shri T. S. Sethi
Society of Indian Automobile Manufacturers (SIAM), Delhi	Shri Prashant Kumar Banerjee Dr Sandeep Garg (*Alternate*)
Steel Authority of India, Centre for Engineering and Technology, Ranchi	Shri Balakrishna Bisoyi Shri Anujit Rituraj (*Alternate*)
Swastik Oil Products Manufacturing Company Private Limited, Mumbai	Shri Bhupendra Rathod Shri Sanat Rathod (*Alternate*)
TVS Motor Company Limited, Hosur	Shri Ajith Kumar
Tata Motors Limited, Pune	Shri Pallipalayam Gowrishankar
BIS Directorate General	Shrimati Nagamani. T Scientist 'E' and Head (PCD) [Representing Director General (*Ex-officio*)]

Member Secretary

Shri Aridaman
Scientist 'B', PCD, BIS

Automotive and Industrial Greases Subcommittee, PCD 25 : 3

Organization	*Representative(s)*
Bharat Petroleum Corporation Limited, Mumbai	Dr Tarunender Singh (***Convener***)
Ashok Leyland Limited, Chennai	Representative
Association of State Road Transport Undertakings, New Delhi	Representative
Bajaj Auto Limited, Pune	Representative
Balmer Lawrie and Company Limited, Kolkata	Representative
Bharat Petroleum Corporation Limited, Mumbai	Shri Vishal Kumar Sinha (*Alternate*)
Gulf Oil Lubricants India Limited, Mumbai	Shri Umesh Chandra Dwivedi Shri M. Asok Kumar (*Alternate* I) Shri D. Vinod Kumar (*Alternate* II)
Indian Oil Corporation (MKTG), Mumbai	Shri A. K. Kandulna Shri Shankar Kr Biswas (*Alternate*)
Indian Oil Corporation (R and D Centre), Faridabad	Shri Ajay Kumar Harinarain Dr Naveen Pokhriyal (*Alternate*)
Standard Greases and Specialities Private Limited, Mumbai	Shri Vijay Deshmukh Shri Babaji Patil (*Alternate*)

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: PCD 25 (14235).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: 601/A, Konnectus Tower-1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	2323 7617
Eastern	: 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	2367 0012 2320 9474
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg Chandigarh 160019	265 9930
Southern	: C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	2254 1442 2254 1216
Western	: Plot No. E-9, Road No.-8, MIDC, Andheri (East), Mumbai 400093	2821 8093

Branches : AHMEDABAD. BENGALURU. BHOPAL. BHUBANESHWAR. CHANDIGARH. CHENNAI. COIMBATORE. DEHRADUN. DELHI. FARIDABAD. GHAZIABAD. GUWAHATI. HIMACHAL PRADESH. HUBLI. HYDERABAD. JAIPUR. JAMMU & KASHMIR. JAMSHEDPUR. KOCHI. KOLKATA. LUCKNOW. MADURAI. MUMBAI. NAGPUR. NOIDA. PANIPAT. PATNA. PUNE. RAIPUR. RAJKOT. SURAT. VISAKHAPATNAM.

Published by BIS, New Delhi